Single Axis Electromagnetic Flow Meter

Model 801

FEATURES

- High accuracy and reliable performance
- Choice of sensor shape for different applications
- Fully bi-directional range of ± 5 m/sec
- Data quality verification
- Logging of up to 999 records
- Three averaging methods
- Waterproof control unit
- External DC power option
- Backlit display, low battery warning
- Selectable units
- OEM versions available
- Choice of output formats
- Real time data interface
- 3 Year Warranty

APPLICATIONS

- River, stream and sewer flow
- Open channel monitoring
- Fresh, waste and saline water

OVERVIEW

Valeport has applied its years of experience in electromagnetic technology to the 801 single axis flow meter. This small solid-state sensor has been designed specifically for use in open channels where fouling by weed or sewage can be a problem.

Valeport's knowledge has ensured that the 801 is a high precision instrument which can be relied upon to give accurate readings.

We offer a choice of two sensors to suit different applications; the flat sensor is suitable for use in very shallow water, while the cylindrical sensor is particularly suited to turbulent or dirty conditions. Both sensors have an accuracy of ± 0.5% of reading (+5mm/sec), and a wide measurement range of ± 5m/s.

The 801 is unaffected by changes in conductivity and can be used in a range of fluids including fresh and waste water, salt water or foodstuffs.

The digital control unit, supplied with the instrument, gives readings of velocity (real-time and average), standard deviation and allows full sampling and averaging setup, and logging of data.

For field use, the rugged case protects the probe and surface unit, and the tough canvas bag means that the wading set is easily carried.

The Model 801 is compatible with the full range of Valeport's hydrological gauging accessories, and is designed for use as a standard wading unit, or in a permanent installation. A choice of optional output formats, and OEM availability, means that the Model 801 can be interfaced to almost any logging device to suit all of your flow measurement needs.

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VALEPORT

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DESCRIPTION

The electromagnetic flow meter is based on Faraday's Law that a conductor [water or any other conducting fluid] moving in a magnetic field [produced by a coil in the sensor] produces a voltage [measured by a pair of electrodes].

The electrodes on the flat sensor are on the top surface of the sensor, so flow is measured above this surface. The sampling volume is a small cylinder whose diameter is the distance between the electrodes, and whose height extends approx. 10mm above the surface of the sensor.

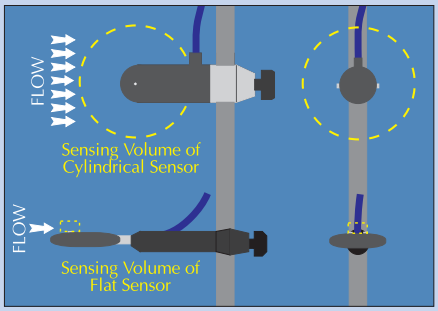
The electrodes on the cylindrical sensor are on the side of the sensor. The sampling volume is a sphere around the body of the sensor, of approximately 120mm diameter.

The smaller sampling volume of the flat sensor makes it very much more suitable for shallow flows, or measurements in confined spaces. However, it is also very much more sensitive to turbulent flows, indicated by apparently noisy real time readings. This effect can be minimised by using a long (>30secs) average period. The larger sampling volume of the cylindrical sensor effectively eliminates the turbulence noise, but also means that a greater depth of water is required for measurements.

The flow rate is indicated on the control unit, which can also log the data, up to a maximum of 999 records. The control unit is also used to set-up many other parameters such as the sampling and averaging periods.

The logged data can be easily exported to PC using RS232 communications, and on line averaged readings are also available via RS232. The addition of an optional PCB also allows on line output via ± 5v, 4-20mA, or 0-10kHz protocols.

Electromagnetic Sensor
Accuracy: ± 0.5% reading plus 5mm/sec
Range: -5 to 5 m/sec (calibrated for positive flow only)
Zero Stability: <5mm/sec
Noise: ± 3mm/sec (can be reduced by using longer averaging period)
Filter: Digital [0.3 Hz]



Dimensions:
13mm x 39mm x 78mm (Flat Sensor)
40mm dia. x 90mm long (cylindrical sensor)
Materials: Polyurethane moulding with integral 8mm diameter polyurethane signal cable
Cable Length: 2m standard (max. 100m)

Calibration
System has integral zero and gain stability checks which result in high calibration stability.

Power Supply
Batteries: Eight 1.5v C Cells
Battery Life [Alkaline cells, 80% duty cycle]: 37 hours measuring time with backlight off, 27 hours with backlight on.
External Supply: 7.5 to 15vDC, 2.3W max.

Environmental
Sensor: Operating temperature: -5 to 40°C
Storage temperature: -10 to 70°C
Control unit: Operating temperature: -5 to 50°C
Storage temperature: -10 to 70°C

Data Interface
RS232 Communications: Real time and logged data output of average flow, standard deviation, date, time.
Optional communications: Real time output of average flow only, on ± 5v analogue, 4–20mA analogue, or 0-10kHz frequency.

Rugged Carrying Case
Dimensions: 405mm x 166mm x 310mm
Weight: 2.3 kgf

Control Display Unit
Display of: Real time flow, average flow, standard deviation of flow in average, countdown of time in average period, average mode and period, data record number and series, date, time and low battery.
Average modes: Moving, fixed or free running [multiple fixed]
Average period: User selectable, 1-600s
Memory: max. of 999 readings
Display Resolution: 0.001 m/sec
Display update: 1 Hz
Units: m/sec or ft/sec
Backlight: Switchable On /Off
Calibration setting: Enables user to input zero and gain for particular unit after calibration.
Hydrodynamic calibration: Enables user to input non-linearity of sensor after calibration.
Beeper: Sounds at 1Hz when sensor on or when keys pressed, and every 5 minutes when unit is in standby. Switchable On /Off.
Dimensions: 244mm x 163mm x 94mm
Weight: 2 kgf
Construction: Moulded in ABS plastic. Membrane keys. Sealed to IP67 [immersion to 0.3 metres for 10 seconds].
Adjustable shoulder strap.
Integral battery pack.
Mil-spec connectors with pro-caps.

Wading set heavy-duty roll bag
Used for wading rods and accessories
Dimensions (secured): 567mm x 160mm x 45mm
Weight: 1.2 kgf

ORDERING

Instrument

0801001: Single axis cylindrical sensor, c/w 2m cable, control display unit (with logging facility), and operation manual. Supplied in ABS transit case.

0801002: Single axis flat sensor, c/w 2m cable, control display unit (with logging facility), and operation manual. Supplied in ABS transit case.

0801507: Alternative output board. Converts RS232 output to ± 5v, 4 – 20mA, or 0 – 10kHz signals.

Wading Set

0801003: Wading rod set c/w 3 x 0.5m graduated rods, base, direction knob, and canvas carrying bag.

Options

0300012: Cable for extracting logged data to PC (can also be used for real time data interface).

0300013: External DC power option.

0801011: Large transit case to take instrument and wading rods (small case and canvas bag not supplied).

Valeport manufactures a wide range of oceanographic and hydrometric instruments including self-recording and direct reading multi-parameter current meters, CTD probes, electromagnetic current meters, tide gauges, open channel flow meters, optical instruments, water and plankton samplers, winches, sinker weights, connectors and accessories.

VALEPORT

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